Isolating Hosts in Layer-2 and Layer-3 to Simplify ND and IPv6 First-Hop Deployments

draft-xiao-v6ops-nd-deployment-guidelines-00

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Why & What

- Why
  - Many RFCs about known ND issues and solutions, no single place of reference
    - RFC6583, RFC 9099 help, but not complete
  - No draft on how to avoid issues; no deployment guidelines
  - This draft fills these 2 holes
- What
  - Analyze existing solutions and extract the wisdoms
    - Isolating hosts in L2 and L3 can be effective in preventing ND issues
  - Describe where to isolate hosts to avoid issues, and how to select suitable solutions for remaining issues.
  - Analyze impact of host isolation to IPv6 first-hop

Unique Contributions

- 1st draft to distinguish L2 isolation and Unique Prefix Per Host (UPPH)
  - L2 isolation: a host cannot send packets via the L2 medium to other hosts. The 1st hop router is the only node reachable in L2.
  - L3 isolation: separate hosts in different subnets, a.k.a UPPH
  - Due to MLSN (multi-link subnet), L2 isolation ~~==~~> UPPH
- Analyzed pros and cons of L2 isolation & UPPH, and their applicability
  - Extract key points from 100+ debate messages about pros and cons of UPPH - valuable insights about ND
- Discussed how to avoid ND issues, and provided deployment guidelines

Example of L2 isolation but not UPPH

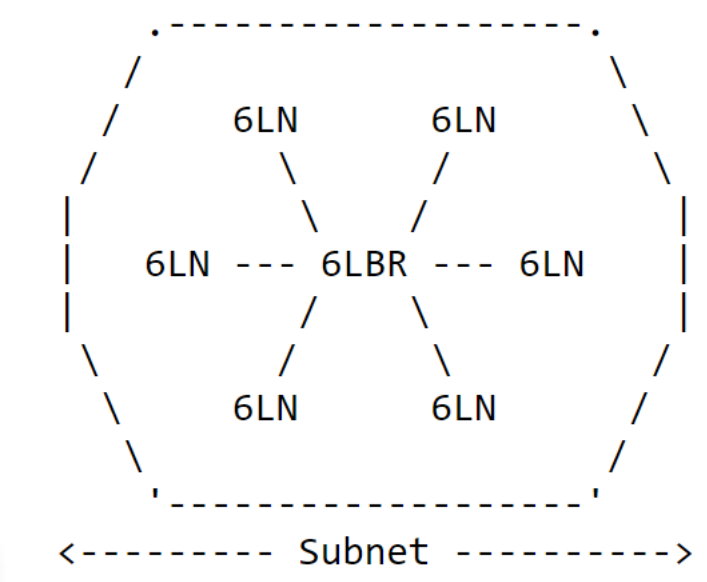

Figure 5, RFC 7668

Suggestions for Reading the Draft

- Do not assume the draft advocates host isolation everywhere
  - Guidelines provided on where not to use host isolations
- Do not assume L2 isolation → UPPH
- Give the draft some benefit of doubt when you have a disagreement
  - We did months of fact checking about what we wrote

- Please review and comment
  - Thanks go to Ted Lemon, Brian Carpenter, Michael Richardson and private commenters
- We welcome further contributions